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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): YOR92000535US2

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on January 12, 2006

Signature: Susan Fortuna

Typed or printed name: Susan Fortuna

Application Number	Filed
09/920,900	08/02/2001

First Named Inventor: Baumgartner

Art Unit	Examiner
2655	Michael N. Opsasnick

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [X] attorney or agent of record. Registration number 36,597
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____

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January 12, 2006
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[X] *Total of 1 forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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JAN 17 2006
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s):	Baumgartner et al.
Docket No.:	YOR920000535US2
Serial No.:	09/920,900
Filing Date:	August 2, 2001
Group:	2655
Examiner:	Michael N. Opsasnick

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Signature: _____ Date: January 12, 2006

Title: Speech Label Accelerators and Techniques for Using Same

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MEMORANDUM IN SUPPORT OF PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The present invention and prior art have been summarized in Applicants' prior responses.

STATEMENT OF GROUNDS OF REJECTION

Claims 1-11, 16-24, 26-28, 33, and 39-44 are rejected under 35 U.S.C. §102(b) as being anticipated by Moshier.

ARGUMENT

Printed Publication

Applicants note that there is a typographical error in the printed publication of the present patent application. In particular, paragraph 71 should read:

> By the earlier argument, each function in L is completely separable. Define a collection of d sets $L_0, \ldots, L_{d-1}$ as follows: L_i is the collection of all ith components of all functions appearing in L. Thus, $L_i = \{f_{j,i}\}_{j=1}^{M}$. Now a key empirical observation may be made. This key observation is that, in general, for large collections of Gaussian mixtures like M, the number of distinct $\langle \mu_{j,i}, \sigma_{j,i} \rangle$ value pairs appearing in the

functions of L is relatively small, even when the total number of distinct Gaussians in M is large. Moreover, even if the exact values of the multitude of $\langle \mu_{j,i}, \sigma_{j,i} \rangle$ values are distinct, to a good approximation they can be represented by a relatively small number of values. For instance, it has been empirically observed that for an acoustic model M containing tens of thousands or even hundreds of thousands of Gaussians, it suffices to have no more than 64 representatives per dimension.

Independent Claims 1, 22 and 23

Independent claims 1, 22, and 23 are rejected under 35 U.S.C. §102(b) as being anticipated by Moshier. Regarding claims 1 and 22, the Examiner asserts that Moshier discloses "wherein ... kernel functions" as pattern score memory (Fig. 10, subblock 328) using word duration and phoneme duration as "atom" values when performing pattern comparison (col. 17, lines 42-60), while using a Gaussian (or Laplacian) to calculate s' (col. 17, lines 4-36); "adder circuitry ... indirect memory" as adding result to the accumulator (col. 17, lines 58-66). In the Response to Arguments section of the final Office Action, the Examiner asserts that "the claim language does not necessarily cover observation likelihoods." The Examiner further asserts that, while Applicants' argument does state what the claim scope covers and what Moshier does not disclose, Applicants' arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Applicants note that the present invention is directed to the efficient storage and evaluation of the large acoustic models required by current speaker-independent, continuous speech recognition systems. Moshier does ***not*** address this problem. In addition, Moshier, for example, does ***not*** disclose or suggest the use of model approximation through *dimension-wise quantization*, and it therefore has ***no*** *component comparable to the indirect memory of the present invention.*

Applicants also note that the cited components disclosed by Moshier have an entirely different function than defined in the present invention. For example, the pattern score memory in Moshier (Fig. 10, subblock 328) supports *dynamic-programming search.* The present invention, alternatively, provides hardware

acceleration for the evaluation of the likelihoods of quantized acoustic models for each observation vector in an utterance as part of a larger speech recognition system. The *indirect memory, atom functions and atom value memory* cited in the claims of the present invention are all dedicated to the *evaluation of observation likelihoods*. The word duration, phoneme duration, pattern score memory and score register cited by the Examiner are used in the *speech recognition search process*, and ***not*** in the *likelihood computation,* and are therefore not applicable to the claims of the present disclosure. For example, the present disclosure teaches that "atom value 830 is added to the partially accumulated log-likelihood from a previous stage (as shown in FIG. 9) by adder 840." (Page 20, lines 21-22.) Thus, the ***atom values*** in the present invention are *partial likelihood scores for a given observation vector*, and are ***not*** comparable to the word duration and phoneme duration constraints disclosed in Moshier.

Thus, contrary to the Examiner's assertion, the limitations cited in Applicants' arguments specifically point out how the language of the claims patentably distinguishes them from the references and Applicants have therefore complied with 37 CFR 1.111(b).

Regarding the Examiner's assertion that the claim language does not necessarily cover observation likelihoods, Applicants note that observation likelihoods are a particular form of a numerical measure of similarity and that the claims of the present disclosure are principally relevant to the computation of observation likelihoods, as outlined above and as would be apparent to a person of ordinary skill in the art.

Thus, Moshier does not disclose or suggest an indirect memory adapted to store a fixed plurality of indexes corresponding to a fixed plurality of atom functions; an atom value memory coupled to the indirect memory, the atom value memory adapted to store a fixed plurality of atom values corresponding to a fixed plurality of atom functions, wherein each of the indexes selects one of the atom values in the atom value memory, wherein each of the atom values is determined for a particular input vector and a particular atom function, and wherein the atom functions are selected to represent a plurality of kernel functions thereby providing an approximation to the plurality of kernel functions; and adder circuitry coupled to the atom value memory, the adder circuitry adapted to add atom values selected by indexes of the indirect memory, as required by

independent claims 1 and 22, and does not disclose or suggest determining, for a particular input vector, a plurality of atom values, wherein each of the atom values is determined from an atom function that represents a plurality of kernel functions thereby providing an approximation to the plurality of kernel functions, and wherein said atom functions are used to label speech; loading a portion of the plurality of atom values into an atom value memory adapted to store a fixed number of atom values; loading a portion of a plurality of indexes into an indirect memory adapted to store a fixed number of indexes, each of the loaded indexes adapted to select one of the atom values in the atom value memory, each of the loaded indexes corresponding to one of a fixed number of kernel functions; selecting at least one index from the indirect memory; retrieving at least one atom value corresponding to the at least one selected index from the atom value memory, one atom value retrieved per selected index; and accumulating the at least one retrieved atom value, as required by independent claim 23.

Claims 6 and 7

Claims 6 and 7 are rejected under 35 U.S.C. §102(b) as being anticipated by Moshier. Regarding claim 6, the Examiner asserts that Moshier teaches "multiple pipeline and adder structures" (FIGS. 6 and 10) and, regarding claim 7, the Examiner asserts that Moshier teaches "an accumulator to the adder (col. 17, lines 35-50)."

Applicants could find no disclosure or suggestion by Moshier that each stage comprises $\lfloor d/(2^n) \rfloor$ sums in parallel, and wherein there are $\lceil \log_2 d \rceil$ stages, and could find no disclosure or suggestion by Moshier that the adder circuitry further comprises a final stage when d is an integral power of two.

Thus, Moshier does not disclose or suggest wherein a number of dimensions is denoted by d, wherein n is a stage number, wherein each stage comprises $\lfloor d/(2^n) \rfloor$ sums in parallel, and wherein there are $\lceil \log_2 d \rceil$ stages, as required by claim 6, and an accumulator coupled to the adder circuitry, wherein the adder circuitry further comprises a final stage when d is an integral power of two, as required by claim 7.

Claim 11

Claim 11 is rejected under 35 U.S.C. §102(b) as being anticipated by Moshier. Regarding claim 11, the Examiner asserts that Moshier teaches "performing on the atom vectors s, x, u in vector (parallel) form (col. 18, lines 17-55)."

Applicants could find no disclosure or suggestion by Moshier that the adder circuitry comprises a pipelined adder chain, wherein the pipelined adder chain comprises a number of single dimension adders, wherein the number of single dimension adders is the same as the number of dimensions, wherein each single dimension adder comprises an adder adding a previous dimension adder output to a selected atom value, wherein the selected atom values are input to each of the single dimension adders in parallel.

Thus, Moshier does not disclose or suggest wherein the adder circuitry comprises a pipelined adder chain, wherein the pipelined adder chain comprises a number of single dimension adders, wherein the number of single dimension adders is the same as the number of dimensions, wherein each single dimension adder comprises an adder adding a previous dimension adder output to a selected atom value, wherein the selected atom values are input to each of the single dimension adders in parallel, as required by claim 11.

Conclusion

The rejections of the cited claims under section 102 in view of Moshier are therefore believed to be improper and should be withdrawn. The remaining rejected dependent claims are believed allowable for at least the reasons identified above with respect to the independent claims. The Examiner has already indicated that claims 12-15, 25, 29-32, and 34-38 would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The attention of the Examiner and the Appeal Board to this matter is appreciated.

Respectfully,

Date: January 12, 2006

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